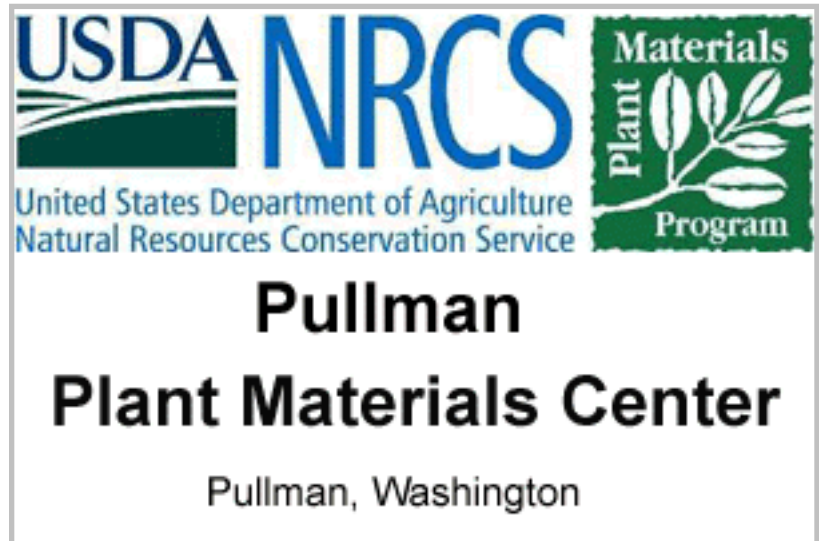


Protocol Information

Dave Skinner
PMC Farm Manager
Pullman Plant Materials
Center
Room 211A Hulbert Hall
WSU
Pullman,
Washington 99163-6211

509-335-9689
509-335-2940 Fax
abbie@wsu.edu



Family Scientific Name: **Fabaceae**

Family Common Name: **Legume**

Scientific Name: ***Lupinus sericeus* Dougl. ex Lindl.**

Common Name: **Silky lupine**

Species Code: **LUSE3**

Ecotype: **Paradise Creek drainage near Pullman, WA**

General Distribution: **Western North America from British Columbia and southwest Alberta south to Oregon, Montana, Wyoming, Colorado and Arizona. In eastern Washington it is typically found in sagebrush, grasslands, and open Ponderosa pine forests.**

Propagation Goal: **Plants**

Propagation Method: **Seed**

Product Type: **Container (plug)**

Stock Type: **10 cu. in.**

Time To Grow: **4 Months**

Target Specifications: **Tight root plug in container.**

Propagule Collection: **Seeds are collected when the pods begin to split in July and August. Pods can be collected individually for maximum seed yield or the entire stalk may be cut. Cutting entire stalks results in collection of much immature seed. Ripening is indeterminant and the pods shatter readily when ripe. Seed collection must be done frequently. Use of Spodnam, an abscission layer inhibitor, did not appreciably reduce shattering. Seed is stored in paper bags or envelopes at room temperature until cleaned.**

There is wide variation in seed size within and among plants. Link (1993) reports 19,700 to 42,000 seeds/pound while Hassell et al (1996) reports a range of 12,900 to 42,000 seeds/pound.

Propagule Processing: **Small amounts are crushed by hand to free the seed, then cleaned with an air column separator. Larger amounts can be threshed with a hammermill, then cleaned with air screen equipment. 70-80% of the seed will shatter free of the pods, and 20-30% can be recovered by hammermilling before cleaning. Use of a hammermill on the shattered portion increases seed damage and is not necessary. Clean seed is stored in controlled conditions at 40 degrees**

Fahrenheit and 40% relative humidity.

Pre-Planting Treatments: The seed coat restricts water uptake and germination is increased by scarification. Seed of *L. polyphyllus* benefits from hot water scarification (Kruckeberg 1996). Some other lupine species require acid or hot water scarification while others germinate without pretreatment (Young & Young 1986). Fresh seed germinates without pretreatment but stored seed should be hot water scarified (Mirov 1939). *L. argenteus* seed should be scarified (McDonough 1969). Romme et al (1995) found, however, that scarification increased the speed of germination but not total germination for *L. argenteus*. The seed of *L. sericeus* is also brittle and easily damaged by mechanical scarifiers. Rubbing the seed by hand between two pieces of sandpaper is effective but it is difficult to control the amount of scarification. Hot water scarification is the most effective method. Water is boiled, then removed from the heat source and seed immediately placed in the hot water. It is allowed to cool for several hours, then planted. Results of trials at the Pullman Plant Materials Center showed 75% emergence by this method.

Growing Area Preparation/
Annual Practices for Perennial Crops:

Seed should be inoculated with the appropriate Rhizobium species before sowing. In January scarified seed is sown in the greenhouse in 10 cu. in. Ray Leach Super cell conetainers filled with Sunshine #4 and covered lightly. Head space of ¼ to ½ inch is maintained in conetainers to allow deep watering. A thin layer of coarse grit is applied to prevent seeds from floating during watering. Conetainers are watered deeply.

Establishment Phase: Medium is kept moist until emergence occurs. Emergence begins in 5 days and is usually complete in 3 weeks. However, a few seeds may germinate after 5-6 weeks.

Length of Establishment Phase: 3 weeks

Active Growth Phase: Plants are watered deeply every other day and fertilized once per week with a complete, water soluble fertilizer containing micro-nutrients.

Length of Active Growth Phase: 2-3 months

Hardening Phase: Plants are moved to the cold frame in late March or early April, depending on weather conditions. They are watered every other day if the weather is cool, and every day during hot, dry spells.

Length of Hardening Phase: 2 weeks

Outplanting performance on typical sites: **Transplanting is done in early May by using an electric drill and portable generator to drill 1.5 inch diameter holes at the planting site.**

Survival in seed increase plantings without competing vegetation averages 90%. Transplanting into sites with existing vegetation reduces survival and vigor depending on weather conditions following planting. Flowering and seed production often occurs the same year as transplanting.

Other Comments: **The plants are short lived but vigorously reseed themselves. Seed may be propelled 10 feet or more from the mother plant when the pod shatters. Seed is also subject to insect predation. Rodents will burrow into and eat the crowns, killing the plants. Some lupines can also be propagated from stem cuttings in a frame with bottom heat (Mirov 1939). Seed maintains high germination after storage of up to 15 years in an unheated warehouse (Stevens et al 1981). Lupines contain poisonous alkaloids in varying amounts depending on species, plant part, maturity, and possibly ecotype. Seeds and fruits have the highest concentrations. Wildlife eat the plants, but they are toxic to domestic livestock, especially sheep.**

References: **Hassell, Wendell, W. Rocky Beavers, Steve Ouellette, and Thomas Mitchell. 1996. Seeding Rate Statistics for Native and Introduced Species. USDI National Park Service and USDA Natural Resources Conservation Service. 25 pp.**

Hitchcock, C. Leo, and Arthur Cronquist. 1973. Flora of the Pacific Northwest. University of Washington Press. Seattle, WA. 730 pp.

Kruckeberg, Arthur R. 1996. Gardening with Native Plants of the Pacific Northwest. 2nd ed. University of Washington Press. Seattle, WA. 282 pp.

Larrison, Earl J., Grace W. Patrick, William H. Baker, and James A. Yaich. 1974. Washington Wildflowers. The Seattle Audubon Society. Seattle, WA. 376 pp.

Link, Ellen (ed.). 1993. Native Plant Propagation Techniques for National Parks Interim Guide. USDA SCS Rose Lake Plant Materials Center and USDI National Park Service. East Lansing, Michigan. 240 pp.

McDonough, Walter T. 1969. Effective Treatments for the Induction of Germination in Mountain Rangeland Species. Northwest Science 43:18-22.

Mirov, N.T. 1939. Collecting and Handling Seeds of Wild

Plants. Civilian Conservation Corps Forestry publ. No.5. US Government Printing Office. Washington, DC.

Piper, C.V., and R.K. Beattie. 1914. The Flora of Southeastern Washington and Adjacent Idaho. Lancaster, PA. Press of the New Era Printing Company. 296 p.

Rickett, Harold W. 1973. Wildflowers of the United States: The Central Mountains and Plains. Vol. 6. (3 parts). McGraw Hill, New York.

Romme, William H., Laura Bohland, Cynthia Perischetty, and Tanya Caruso. 1995. Germination Ecology of Some Common Forest Herbs in Yellowstone National Park, Wyoming, USA. Arctic and Alpine Research 27:407-412.

Rose, Robin, Caryn E.C. Chachulski, and Diane L. Haase. 1998. Propagation of Pacific Northwest Native Plants. Oregon State University Press, Corvallis, OR. 248 pp.

St. John, Harold. 1963. Flora of Southeastern Washington and of Adjacent Idaho. 3rd edition. Outdoor Pictures. Escondido, CA. 583 pp.

Stevens, Richard, Kent R. Jorgensen, and James N. Davis. 1981. Viability of Seed From Thirty-two Shrub and Forb Species Through Fifteen

Years of Warehouse Storage.
Great Basin Naturalist 41:274-
277.

USDA NRCS. 2007. The PLANTS
Database (<http://plants.usda.gov>, 20 March 2007). National
Plant Data Center, Baton
Rouge, LA 70874-4490 USA.

Young, James A. and Cheryl G.
Young. 1986. Collecting,
Processing and Germinating
Seeds of Wildland Plants.
Timber Press. Portland, OR.
236 pp.

Citation:

Skinner, David M. 2007. Propagation protocol for production of container
Lupinus sericeus Dougl. ex Lindl. plants (10 cu. in.); Pullman Plant Materials
Center, Pullman, Washington. In: Native Plant Network. URL: [http://www.
nativeplantnetwork.org](http://www.nativeplantnetwork.org) (accessed 21 March 2007). Moscow (ID): University of
Idaho, College of Natural Resources, Forest Research Nursery.